A SYSTEM AND METHOD FOR GRANTING ELECTRONIC RIGHTS USING THE SIGNATURE OF DISTRIBUTABLE PHYSICAL MEDIA

CROSS REFERENCE TO RELATED APPLICATIONS

1. This application claims priority under 35 U.S.C. § 119(e) from provisional application number 60/175,966, filed January 13, 1999. The 60/175,966 provisional application is incorporated by reference herein, in its entirety, for all purposes.

BACKGROUND OF THE INVENTION

2. The present invention relates generally to the field of digital communications. More particularly, the present invention relates to the use of a physical media signature to establish media rights and allow replication and other derivative services (including streaming of content to a customer) concerning a physical media by a service provider on behalf of an owner of the physical media.

3. Conventional physical entertainment media distributed through physical channels (e.g., retail outlets) has some form of encoded identification (e.g., signature), either explicit or implicit from the structure and form of the content that can be used to determine its SKU. In some products, the media also has data that describes the media contents.

4. The purchase of a physical media (e.g., a compact disk, DVD, DAT tape) grants the purchaser under copyright law certain limited rights to create electronic copies for their personal use. Other copying privileges may exist due to provisions of private contracts between the copyright owner and others. These electronic copies can be made and stored on any variety of devices including analog audio tape, recordable CDs, DAT tape, videotape, a local storage device, and a remote storage device on a network ("network"

meaning anything from a small LAN to a global interconnected network of networks, such as the Internet).

5. Typically, with conventional approaches, the user has to copy or convert the entertainment media from physical format into a digital electronic format on their own through any of a variety of means. Some examples of ways to do this are: buying an extra record/play device, borrowing a friend's record/play device, purchasing multiple copies of the same music in different formats, or buying a computer and software capable of recording a CD and the like. In some cases the physical media may already be in a digital electronic format and the user is simply copying.

6. Such conventional methods are expensive, time-consuming and inconvenient.

7. What is needed is a convenient way to provide a consumer who has purchased a recorded work with a copy of that work in a digital electronic format.

SUMMARY OF THE INVENTION

8. It is, therefore, an object of the present invention to provide a structure and method that uses the signature of the media on which the work is recorded to establish media rights and allow additional, outside parties to create and provide the digital copies of the media according to the rights granted by the purchase of the physical media, as well as other copying privileges that may exist according to private contract.

9. One aspect of the present invention is a system that uses the media signature encoded on a physical media to grant electronic rights. This system includes a media signature detector for determining, detecting, and reading a media signature on a physical media and a media signature judging unit for determining a specific title of an

entertainment form. The media signature detector according to the present invention computes a signature that is statistically unique (i.e., having a vanishingly small chance of confusion) from a physical CD, digital audio tape, DVD, or HDCD.

10. The invention provides a given user with access only to media that that user has purchased (and therefore has rights to copy for personal use). The user's access to the service is protected by an authentication of identity and the website performs a fraud watch function automatically to ensure that only an authorized user copies the media which they have rights to copy. Authentication of identity is implemented using any effective technique, including (but not limited to) biometric comparison, a smart card, or even a simple password protocol.

11. With the present invention, the user is afforded many advantages including rapid and convenient replication. There are safeguards and safety feature to provide privacy and security to the user and protect the interests of copyright holders. For example, the invention uses a website with a database only accessible to authorized users.

12. Additionally, the invention offers special features that enhance the user's enjoyment of the music on the CD. For instance, different formatting options can be programmed for allowing songs to be linked together or combined to suit a user's need. Also, the music can be reformatted periodically as popular user formats and capabilities change. A further special feature enables blockage so that overplaying (e.g., too many "plays" of a recorded piece of music, etc.) does not occur.

BRIEF DESCRIPTION OF THE DRAWINGS

13. Additional objects and advantages of the present invention will be apparent in the following detailed description read in conjunction with the accompanying drawing figures.

14. Fig. 1 illustrates a flow diagram illustrating methods for practicing the invention.

15. Fig. 2 illustrates a block diagram of a system according to an embodiment of the present invention.

16. Fig. 3 illustrates a block diagram of a system according to another embodiment of the present invention.

DETAILED DESCRIPTION

17. According to the signature detection aspect of the present invention, a signature is computed from a physical media item (e.g., CD, digital audio tape, DVD, or HDCD) that is reasonably unique. The signature is provided by a purchaser of the media to a service provider. The service provider then provides a digital copy of the CD to the original purchaser in a variety of formats. The service provider is not limited to how it obtains the digital copy to be provided but typically a single physical copy purchased by the service provider is held in a database and used for any number of approved purchasers. Alternatively, it is by accessing the original physical media of the purchaser (e.g., via an upload from the purchaser's PC).

18. Referring to **Fig. 1**, a flow diagram illustrating methods for practicing the invention is illustrated. This unique method establishes media rights and allows the purchaser/owner of the media legitimate replication ability. First, a customer (or "user") purchases **110** a physical media, such as a compact disc, from a vendor (e.g., retail store, mail club). Next, the customer obtains **120** from a service provider (via traditional means, over the Internet, etc.) a computer program for determining the digital signature of the CD.

19. The computer program is alternately embodied as a local application, a JAVA application, an OCX, or any other program that can physically access the media. The program reads the media to determine its primary type (such as an audio CD, DVD, and CD-ROM) and then uses the specific format of the primary type to read pertinent data. According to a preferred mode of operation, for a standard audio CD, the pertinent data is the number of tracks on the CD and the length of each track. For details of implementation of such an algorithm, refer to U.S.P. 6,061,680 to Scherf *et al.* Alternatively, for more advanced audio CDs, this would be the extended track data, including the name of the artist, the name of the album and the name of the individual tacks. This pertinent data is then used to calculate the media signature. In the case of an audio CD, this is effectively done using a simple hash (e.g., MD5 or SHA) of the number of tracks and the track lengths in a specified format.

20. The scope of the present invention is not limited to calculating the signature as described above, but is effectively practiced using more straightforward techniques. A suitable alternative is for the signature reader to directly read a signature in a physical media that contains an explicit SKU and/or a serial number (e.g., the 2,334,227th copy of a particular CD) to read.

21. Another alternative embodiment is to generate a signature for the physical media that is statistically unique (i.e., having a vanishingly small chance of confusion) based on manufacturing errors present on the physical media. This error signature is computing from the physical media item and is as unique as a fingerprint. All CDs (as well as other similar digital recording techniques) contain a plethora of random bit errors that are an unavoidable result of the manufacturing process. It is statistically impossible that any two

CDs will have the exact same random bit errors over the literally billions of bits that are recorded on those items. Of course, these errors are rarely evident to the user because the recorded bits are encoded using error correction coding (typically according to a Reed-Solomon cross-interleaved code) that is very forgiving of these manufacturing errors, and is capable of faithfully reproducing the recorded work from all but the most egregiously mis-manufactured CDs. A signature generated according to this alternate embodiment exploits these errors (rather than correcting and hiding them) for their inherent statistical uniqueness.

22. Another alternative embodiment is to generate a signature for the physical media that is statistically unique based on selected reading of music data at specific locations across the CD. The specific locations are preferably selected relative to each track (e.g., thirty seconds into each track). Optionally, the specific locations are selected based on their absolute location on the CD.

23. Once a signature is ascertained, the customer transmits **130** to the service provider the digital signature corresponding to the physical media they have purchased. The service provider analyzes **140** the signature to determine which particular CD title the consumer has purchased. Upon approval **150** of the signature, the service provider obtains a digital copy of the CD and makes available **160** digital services to the consumer concerning that CD. These services include (but are not limited to) streaming music from the CD to the consumer or providing a digital copy of the CD.

24. According to the method of an alternate embodiment of the present invention, the customer/user need not be bothered with taking the action of obtaining **120** special purpose software and sending **130** a digital signature to the service provider. When the

purchaser buys a CD (on the Internet, from a store, or otherwise) **170**, the seller of the CD provides **180** an electronic proof of purchase to the buyer and the seller also sends **190** a copy of the electronic proof of purchase directly to the service provider. The service provider then grants **150**, **160** equivalent rights to the consumer as are granted in a method relying on a media signature.

25. Referring to **Fig. 2**, the invention has a service provider domain **200**, including a central media storage infrastructure **210** that contains a reservoir of audio data in electronic format, or optionally as a collection of physical media (e.g., audio CD's), for use by the service provider. The central media storage **210** is accessed by a general purpose computer **220**, which includes a CPU **222**, a signature judging module **223**, an encryption module **224**, and a transmitter/receiver **225**.

26. A user **230** logs onto the service provider's website using a web access device **240** (for example, but not limited to, a personal PC) containing a CPU **241** which has a media signature detecting module **242**, and a transmitter/receiver **243**. The user logs into the service provider website via a sign-up process and is to upload a CD to be copied from a disk drive **244** via a transmitter/receiver **243** which is then encrypted with an encryption module **224**.

27. If the CD has already been pre-positioned at the provider domain **200**, the invention allows faster access time (as compared to the prior art) to digital services or copies from the service provider domain **200** (e.g., about 3 to 5 seconds as compared to 30 minutes with conventional methods). That is because the actual music on the CD is not being ripped, encoded, and uploaded, only the signature is being uploaded. The signature

is then matched to items in the central media storage **210** by using the signature judging module **223** to see if the media title is already in the database.

28. Conventional methods require the user to copy, reformat, and transmit all of the content contained on the purchased entertainment media via tedious, lengthy uploads. The long upload time is costly in terms of system time. The present invention eliminates this long upload time by only requiring the transmission of the media signature and instructions as to which formats the user would like the service provider to provide.

29. Referring to **Fig. 3**, a block diagram of a system according to another embodiment of the present invention is illustrated. This embodiment of the present invention eliminates the need for the customer/user to bother with obtaining special purpose software and sending a digital signature to the service provider. Rather, this is taken care of by the merchant **310** who sells the physical media to the customer **320**, using a purchase validation apparatus **330**. When the customer **320** buys a CD (on the Internet, from a store, or otherwise), the merchant's purchase validation apparatus **330** generates a unique electronic proof of purchase using a cryptographic module **332**. This proof of purchase is provided to the buyer along with the CD, and the purchase validation apparatus **330** transmits a copy of the electronic proof of purchase directly to the service provider domain **340**.

30. The service provider analyzes the proof of purchase using a signature judging module **343** to determine which particular CD title that particular consumer **320** has purchased. Upon approval of the transaction, the service provider ensures that a digital copy of the CD has been placed in its central media storage infrastructure **350** and makes the copy available to the consumer **320**. The proof of purchase is matched to items in the

central media storage **350** by using the signature judging module **343** to see if the media title is already in the database.

31. A user **320** logs onto the service provider's website using a web access device **360** (for example, but not limited to, a personal PC) that need not have a media signature detecting module. The user **320** is provided through their device **360** with digital electronic copies of the work they have purchased in the formats they specify. Formats that are commonly used at this time, such as MP3, RealAudio, and Windows Media Audio (WMA), are available, and there is no reason that future file formats cannot be used to implement the present invention. The various embodiments of the present invention are format independent and are not limited by the particular formats used to implement them.

32. In addition to faster replication speed, the invention also offers the user many other advantages. For example, the many safety features provide greater security and privacy than found in the conventional art.

33. As described above, methods and apparatus embodied according to the present invention offer unique feature that increase selection options and enhance the user's overall enjoyment of the music on the CD. The ability is provided for favorite songs to be linked together and mixed according to the user's tastes and preference. Users also benefit from on-site advertisements that inform them of other similar music that may be of interest and can be made available to them.

34. The invention obviates the need for the end customer to worry about fraud or copyright infringement and, according to certain embodiments, it protects vendors and copyright holders from losing sales through illegal and unauthorized copying of media.

35. The present invention has been described in terms of preferred embodiments, however, it will be appreciated that various modifications and improvements may be made to the described embodiments without departing from the scope of the invention.